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BULGARIA

STRONGER MEASURES URGED TO PREVENT WATER POLLUTION

Sofia IKONOMICHESKA MISUL in Bulgarian No 9, 1976 pp 72-78

[Article by Margarita Vaklinova: "Need To Improve Economic Incentives and Penalties for the Protection of Water Resources From Pollution"]

[Text] One of the most topical problems which must be resolved successfully in our country is that of environmental protection. In the interest of future progress we must reduce to a minimum air pollution, protect the purity of the water from industrial and other pollutants, and struggle against steadily rising noise pollution.

Water is one of the most important structural elements of the natural environment. It is not only a necessary biological factor but an element of socioeconomic development. However, with the steady development of industrialization, the concentration of productive forces, and the appearance of new industrial sectors the pollution of water reservoirs is quite intensive as a result of the release of untreated water in them. The losses suffered by the national economy as the result of water pollution are rising steadily and the losses inflicted on the flora and fauna are difficult to correct. As the result of the accelerated development of industry and agriculture, and of urbanization processes, our water needs are growing. Hence the need for the more effective utilization of the water.

The distribution of the water and its use are related to the activities of all national economic sectors. Such ties are expanding even further, and water resources are becoming an irreplaceable part of the socioeconomic infrastructure of the country. Water is not only a raw material (for the food, chemical, and other industrial sectors), a capital good (production of electric power), and a medium for the organization of the production process (certain chemicals, navigation, and fish breeding), but also a factor for maintaining human living conditions (recreation, hygiene, sports, treatment, and tourism). Let us also not forget the steadily growing need for fresh drinking water for the people. The quantity of water resources is limited and the need for water is unquestionably rising as the result of the accelerated growth of some sectors and of population expansion. All this calls for creating an economic incentive for enterprises to lower the harm

caused the national economy as the result of water pollution. Economic incentives through which the more effective utilization of water resources will result must be provided to ensure the maximal satisfaction of the needs of the various water consumers.

Characteristically, many countries throughout the world have already established the necessary economic incentives and penalties aimed at the more effective utilization of water resources and reducing their pollution. These problems have been successfully resolved by the CEMA-member countries. The measures which were earmarked have been given the force of laws. We know that the losses caused by releasing untreated water in excess of stipulated norms are continuing to grow in a number of countries. However, the requirement that every violator compensate for the damage he has caused has been raised in those countries evermore urgently. To this effect it would be proper to establish a criteron to be used in determining the size of the compensation.

Levying fines on guilty enterprises and organizations is one of the measures for improving the quality of the sewage water and ensuring the more effective utilization of water resources. In this case the following principle should be observed: he who pollutes pays; he who treats is rewarded.

In this connection let us briefly consider the existing incentives and penalties for releasing sewer waters by some CEMA-member countries. This is necessary with a view to the even more successful solution of this problem in our country. For example, as of 1 September 1971 the USSR has applied the so-called basic law on waters which is valid within the Soviet Union as a whole and the individual union republics. A general plan has been elaborated for the comprehensive utilization of water resources through 1980. A similar solution has been provided for problems related to worsening the quality of natural water. Economic incentives have been formulated to lower the pollution level of sewage waters which cause damages to the flora and fauna difficult to repair. There are three types of payments for the treatment and disposal of sewage waters: a. when group or regional treatment stations are in operation; b. when insufficiently treated sewage water is dumped in low-volume rivers; c. when insufficiently treated sewage water is released in water reservoirs containing considerable amounts of water and possessing great self filtering capacity.

An economic experiment is underway for the more efficient use of the water in the GDR, in the area of Halle, which is a big industrial center with plants releasing large quantities of pollutants (potassium, chloride, magnesium, and other salts). The experiment is conducted in two directions: a. the price of clean water is established; b. corresponding economic incentives are established for treating polluted waters and penalties are levied for water pollution. The water users pay for the quantity of water used in accordance with a utilization fee different for the various consumers. Thus, the price of surface drinking water is 0.01 marks per cubic meter; water for industrial purposes costs 0.043 marks per cubic meter. In the case of

power producing equipment with water cooling only utilization losses (adding fresh water) are paid for at the rate of 0.043 marks per cubic meter. The price for the use of subsoil waters has been established as well. The experiment calls for economic incentives and penalties for the protection of water resources from pollution. The amount of the penalties is based on the cost of treatment, the facilities for sample taking, and the cost of the analysis of sewage waters. The admissible concentration of pollutants in sewage waters has been determined and so has the amount of the fine to be paid in the case of violations (water polluted in excess of the admissible concentration). This mechanism has been given the force of law which was published in the GDR official state gazette. With a view to encouraging agricultural production, agricultural enterprises have been allowed the free use of water for personal needs. The same applies to the use of water for recreation and sports, treatment, and artificial feeding of subsoil waters. As a result of this experiment considerable funds are collected and deposited in a special account. Should the results of the experiment turn out to be successful, the system of payments and penalties for the protection and utilization of the water will be applied on a country-wide basis.

The economic mechanism related to the Hungarian water resources is also governed by a law. The management of water resources was made a separate sector on the basis of the law on water and a special governmental decree. The economic incentive here is provided by additional payments and fines as a coercive means for saving water. A system of progressive fines for water pollution has been applied, intensifying the protection of water qualities and protecting the water from pollution. Thus, for example, any enterprise which fails to observe the stipulated norms for the release of sewage waters pays a fine. The amount of the fine is stipulated for each individual pollution indicator should admissible concentrations be exceeded.

Poland has an economic mechanism for the rational utilization of available water and its protection from pollution. According to it payments are made depending on the amount of water used taking into consideration both the quality and quantity of the local water source. The water price is differentiated among three zones: a. a zone with a water basin balanced in advance; b. a zone with a negative water balance; c. a zone with a surplus water balance. In the short supply zone the price of the water will be raised to the level of factual costs while in the surplus zone the price of the water will be lowered compared with its present level. Economic measures have been elaborated to protect the water from pollution, calling for fines depending on the quantity, condition, and composition of sewage waters.

In Czechoslovakia, according to the existing economic mechanism, the water consumers may be divided into three categories: a. population, children's institutions, and institutes. The payment rate is 0.6 koruni per cubic meter; b. communal-consumer enterprises--1 koruna per cubic meter; c. industrial enterprises and state institutions--3.7 koruni per cubic meter.

The amount of the fine and the admissible concentration are based on the type of pollutant. The fines are specified with the use of corrective coefficients which depend on the amount of water in the water reservoir, the means for its tapping, its self filtering capacity, and so on.

A general assessment of the existing situation concerning economic incentives and penalties for the utilization of water resources and their preservation from pollution by CEMA-member countries would lead us to note that certain difficulties exist in the solution of such problems. They apply, above all, to determining the size of the fines based on individual pollution indicators. Furthermore, quite frequently the fines cannot compensate for the losses caused and some losses cannot be even a numerical value (losses caused by epidemics, reduction of livestock production and plant yields, unproduced goods, and others).

As we pointed out, the problem of environmental protection is becoming evermore topical in our country as well. The accumulated experience uncontroversially proves that the more effective utilization of water resources and their protection from pollution may be accomplished with the help of technical and socioeconomic measures which must become an inseparable part of the national economic plan.

The need for the establishment of an economic mechanism which would encourage water consumers to engage in the most thrifty and effective utilization of resources and force them to lower the concentrations of polluting substances in refuse waters increases along with the increase in the role which water resources play in the socialist economy and the expansion of relations between water sources and other national economic sectors. To this effect we must elaborate a system of indicators leading to a qualitative characterization of the dimensions of the environment. The development of a method for the determination of such indicators should become an important economic management task. The properly elaborated indicators should be included in the long-range plans for the socioeconomic development of the country. All this enhances the requirements governing water resources and their significance in the planned development of our economy. The struggle for the protection of the environment must be waged above all through economic means which must be focused on encouraging the enterprises to lower the concentration of polluting substances in sewage waters and contribute to the thrifty and rational utilization of water resources.

The study of the payment method used so far indicates that it does not contribute to the economical and comprehensive utilization of our limited water resources. That is why the creation of a new and more effective system for water payments and the elaboration of scientific incentives and penalties for lowering water pollution are an objective requirement in the development this important realm of human activities. The elaboration of such a price system is not a self-seeking aim but an exceptionally important means for the elimination of the consequences of water pollution which affect the entire society. Its main task is to encourage the most rational utilization of water resources with a view to the fuller satisifaction of needs.

The price of the water should generally correspond to the socially necessary expenditures for supplying it to the consumer. So far use was made of price differentials of individual water resource rayons and okrugs. Thus supplies to the individual water consumers were governed by a great variety of conditions. In order to surmount this shortcoming a uniform price of the water must be established for the entire country, differentiated by consumer. In this case the differential between the costs to society and those to the individual okrugs should be deposited into a special state fund. This would block the accrual of benefits to some water consumers and the damaging of others caused by the fact that some are located in areas with abundant water resources while others are not. We must also approve economically substantiated prices for water consumers in industry, agriculture, and power industry, the population, and others. However, in order for the price to be able to play to a maximal extent its role of stimulator in the more economical utilization of water resources a certain increase in the existing price in percentage per cubic meter of clean water is necessary. This should take place whenever the stipulated outlay norm per individual water consumer is exceeded. To a certain extent this will help to eliminate the waste of water resources. It should be applied particularly in cases in which the consumer repeatedly violates the water consumption norm.

Making an economic assessment of the water we must take into consideration the factual expenditures incurred in the study, survey, maintenance, and repair of water pipes and installations needed for their use. The economic measures related to improving the quality of sewage waters and the purity of water reservoirs may be reduced to the following: a. prompt detection of violations and determination of the amount of fines to be levied for the pollution of sewer waters in excess of admissible norms; b. establishing the necessary costs for building and maintaining treatment installations; c. providing regular control on the part of a proper authority, thus reducing the damages. Such control should be periodical depending on specific production technology.

Particularly necessary in this respect is the development of specific economic incentives which would encourage the treatment of sewage waters as well as penalties of individuals who release polluted waters. Such measures should apply above all to management and executive cadres directly involved in water treatment as well as economic units which release polluted waters in excess of the stipulated norms. The treatment of sewage waters should be considered an inseparable part of the production technology of the enterprises.

The Law on the Protection of the Air, Water, and Soil from Pollution, passed in 1963, stipulates penalties for the violators. However, it contains no provisions for settling the means through which polluting enterprises could be penalized. For the time being, we are levying only one-time fines against the managers of an enterprise which has released sewer waters in excess of the stipulated norms. Directive no 68 of the Council of Ministers, published in DURZHAVEN VESTNIK, no 6, 1976, shows the norms for

determining the admissible level of pollution for the various categories of surface waters based on individual indicators. Three categories have been established for our country. The first includes those which may be used to meet drinking and residential needs. The second category includes conventionally clean water used for industrial purposes. The third category applies to water used for irrigation.

The released sewage waters must not exceed the norm of the specific water receptacle category. The observance of stipulated norms is entrusted to the respective departments releasing sewage waters. Control over the implementation of this directive has been entrusted to the authorities of the Water Protection Inspectorate and the Ministry of Public Health. The economic measures should either stimulate or penalize the production unit (water consuming enterprise). Should the respective enterprise lack a treatment station, such a station should be built within a stipulated deadline. Furthermore, new enterprises may not be commissioned if not equipped with treatment systems.

The amount of the fine should be such as to force the enterprises to eliminate the reasons for releasing polluted sewer waters in excess of the stipulated norm rather than pay the penalty. In turn, the fine should be such as to cover damage caused to the national economy.

There are essentially two ways for determining the fine: a. determining its amount based on the individual pollutants. To this effect we must calculate the expenditures for treatment per unit pollutant (oxidizers, insoluble objects, and others). Determining the individual fines for each individual pollution indicator is very difficult, since for the time being we do not have data on the amount of expenditures for the treatment of each individual pollutant; b. the amount of the fine could be established by taking into consideration the stipulated expenditures for keeping the treatment installations operational. This method has certain advantages, for it enables us to compute reduced expenditures with relative accuracy.

On this basis, the fine could be determined in accordance with the following formula:

$$F = C_a + C \times E_n,$$

in which C_a represents the annual cost of raw materials, materials, labor, and electric power needed for operating treatment stations; C represents capital investiments needed for building treatment systems; and E_n stands for the normative effectiveness coefficient.

The definitive amount of the fine is achieved with the use of a correction coefficient depending on the category of the water reservoir, its self purification capacity, the interests of the individual water consumers, and so on. The thus established fine for one day is multiplied by the number of days during which the filtering equipment is not operating at full capacity.

The fines are collected as of the time the violation has been noted to the time of its elimination. In order to play a stimulating role such fines are neither planned nor should be included in production costs so that they may affect directly enterprise profits. This will interest the enterprise in the prompt elimination of the reasons for the violation.

The number of pollutants is determined on the basis of the analyses of samples taken. Such samples must be taken periodically in accordance with the technology of the production process or on the basis of a given signal. This could be achieved by installing a system for automatic control of water pollution. Such control should not merely represent a recording device and the water samples must not be taken after a certain delay thus reducing the damage caused. In other words, water quality must be subjected to uninterrupted control. Such control is provided by the established rayon inspectorates in charge of water protection covering the entire country. They determine whether or not the quality of the sewage waters is consistent with the respective category of the water reservoir. Should the sewage waters fail to meet the stipulations, the violators are fined.

Permanent control calls for the establishment of control centers equipped with instruments for automatic reading and transmittal of pollution indicators (biological need for oxygen, oxidability, suspended matter, and so on). Should a violation be signaled a special team conducts an investigation on the spot and determines the reasons for the violation, while the competent authority in charge of water resource control files a claim against the respective polluting enterprise requesting the payment of a specific fine. The payment of the fine does not relieve the violators from the obligation to eliminate the reasons for pollution.

The fines collected from enterprises which release sewage waters in excess of the stipulated norms should be deposited in a special fund entitled "Environmental Protection." The thus collected funds will be used for reconstruction, maintenance of treatment installations, and bonuses to some water users who do not exceed outlay norms and do not release polluted water in excess of the stipulated norms. The correction coefficient through which the price per cubic meter of clean water may be reduced could play the role of a stimulator in the case of proven economical utilization of the water. Such a coefficient should range from 0.8 to 1.

Economic penalties are applied in the following cases: a. when the enterprise has treatment systems yet releases polluted water in excess of the stipulated norm. In this case the amount of the fine is based on that of the expenditures needed to ensure the proper utilization of treatment facilities; b. when the enterprise does not have any treatment systems. In such a case the amount of the annual fine is based on the amount of capital investments needed for the building of the necessary equipment and its annual operational cost. Data applicable to enterprise treatment stations may be taken from the cost estimates or, if such documents are lacking, documents of similar enterprises could be used.

The enterprises must pay a specific fee for releasing sewage waters, consistent with the qualitative and quantitative indicators governing sewage water. The thus collected funds are deposited in the Environmental Protection Account and are to be used for the building of new and reconstruction of existing facilities and as material incentive. The amount of such fees could be determined in accordance with the following formula:

$$T = \frac{F}{N},$$

in which:

F is the overall amount of funds needed for the building and maintaining in operation filtering equipment;

N is the equivalent number of residents (population, industry, and agriculture).

The thus established single fee is multiplied by the equivalent population size for each individual water consumer. The result is the overall amount which the enterprise releasing polluted water should pay. Another measure which would force the respective enterprises to treat the sewage water to a level suitable for reuse is for the enterprises to be forced to take the necessary amount of water they need below the area where they have released their own used water.

Material incentive would play a particularly important role in the effective utilization of water resources. In the case of proper operation of treatment systems maintained in a state of constant readiness corresponding bonuses should be awarded. Those directly involved in the treatment of sewage waters should be given incentives. Bonuses should be awarded to workers and management personnel engaged in water treatment. Such bonuses should be paid out in the following cases: a. regular operation and maintenance in a state of constant readiness of treatment stations and systems; b. savings of clean water by applying dry production methods, water recycling, or new technological processes. The bonus could be as high as 50 percent of the cost of the water saved; c. utilization of waste from the treatment of sewage waters. Such bonuses should be as high as 50 percent of the price of the utilized waste. The amount of a bonus may not exceed three monthly wages.

Bonuses should be paid to workers and managers who have directly contributed to such savings regardless of whether or not the enterprise has fulfilled its production plan. Should the enterprise fulfill its plan and be givin a bonus, such a bonus should be paid also to the personnel engaged in the treatment of sewage waters. Such bonus funds must be drawn on the Environmental Protection Account.

In order to develop a universal interest in the preservation of water resources economic incentives and penalties must be given the force of law. The experience of the socialist countries has indicated that such laws contribute to the effective utilization of water resources and to lowering the pollution of released sewage waters. The accurately computed fines will determine whether or not the enterprises will be encouraged to clean the water from pollutants and lower the amount of water used. The size should be such as to encourage the management to invest promptly the necessary funds for the construction and commissioning of treatment systems rather than pay fines.

In conclusion, let us emphasize that in recent years ever greater attention has been paid to environmental protection problems. Considerable funds have been allocated for this purpose used for the building and utilization of a number of treatment stations and systems. The volume of capital investments allocated for the protection of water resources will be increased substantially in the next one or two years. To this effect we must supervise the timely use of such funds.

The proper application of such economic incentives and penalties will result in considerable economic benefits and will reduce losses suffered by the national economy as a result of releasing polluted water in excess of the stipulated norm, and in the more effective utilization of available water resources.

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NEED FOR ENVIRONMENTAL SPECIALISTS STRESSED

Warsaw AURA in Polish Dec 76 p 1

[Text] We have written several times on the subject of the environmental protection program recognized as one of the crucial socioeconomic activities in the complex program of the socialist development of the country. We discussed, among other things, the extent and the scope of investments and presented information about the cadres who will be fulfilling this program. Thus we asked the Ministry of Administration, Local Economy and Environmental Protection, which has the authority to establish directions, programs and methods of instructing and improving the cadres of the national economy in the area of protecting the human environment, how the program of educating the cadres is progressing and what we should expect in the next few years.

It is known that preservation or reclamation of the environment requires not only technical, economic and administrative resources, but also the existence of properly prepared economic, technical and engineering manpower. Meantime, analysis of the utilization of existing equipments serving the protection of the environment shows in many cases that they are improperly exploited and maintained and do not achieve the planned level of pollution reduction. One of the causes of this situation is an insufficient number of skilled personnel to service these equipments. Because of this situation many plants place engineers and technicians with various specialties, who do not have an adequate background in the area of environmental protection, in positions of responsibility for using equipment to treat sewage, gases and dust, in positions of supervision and control, and in laboratories. This situation makes it necessary to educate and improve the cadres of specialists for the entire national economy.

Compulsory additional training of personnel in protecting water and the atmosphere from pollution, and in the general problems of protecting the human environment, has been introduced for certain positions in industrial and municipal plants, scientific institutes, the planning offices, the central offices and ministries, the unions and administrative offices. The training center in Debem performed the basic role of providing additional

training for personnel in the area of environmental protection. The schools of higher learning which had postgraduate studies in this area performed a supplementary role.

In the previous five-year plan, it was planned to train more than 10,000 people in environmental protection (half in the Debem Center, the rest in the offices, departments and NOT [Chief Technical Organization]), not including postgraduate studies. The fact that not all departments have appreciated the need to improve qualifications is illustrated by the low attendance record at some courses; for example, the course for the staff of the foreign trade and marine management department was only 68 percent filled; this same is true of the machinery and construction materials industries. Positions requiring special qualifications were not properly filled. Only 62 percent of students attending the instructional courses were qualified with regard to education and 71 percent with regard to work experience. A supplementary role in improving the cadres was performed by postgraduate studies given at universities in sanitary engineering departments. About 600 engineers finished these studies.

One can expect some improvement, however. This certainly will be brought about by realizing the training program for 1976-1980. Dynamic development of industry and changes in the structure and functioning of local administrative organs brought out the need to correct the planned training program. This program includes training cadres in school systems, instructional courses, improving qualifications during postgraduate and doctorate studies, professional specialization of engineers, and training in the country and abroad. Each large organizational unit should have a department for environmental protection, and staff members of these departments should have a high school or higher education in this area, a specialized course, or postgraduate studies. It is estimated that the entire economy will require 32,000 qualified personnel in 1980.

Technical schools of higher learning play the chief role in training cadres in the school system. At present about 24 schools have studies in this area. They will educate 3,600 specialists in 1976-1980. Trade technical schools and post high school trade studies prepare technical personnel. In the previous five-year plan, secondary schools trained 2,000 technicians in water technology and 200 technicians in air protection. The network of these schools has substantially decreased, and thus there will be fewer graduates in the current five-year plan. Moreover, the basic trade schools which trained operators of water purifying machinery (agriculture department) were closed.

Development of postgraduate studies will be dependent upon regulation of financing and benefits to which students are entitled and upon introduction and popularization of a professional specialty for engineers which can be achieved through graduation from special postgraduate studies. Present legal regulation of financial aid and benefits for postgraduate students has curtailed some specialty studies and hampered their development.

ROMANIAN CONFERENCE ON POLLUTION BY PESTICIDES

Bucharest REVISTA DE CHIMIE in Romanian Feb 77 p 192

[Report by C. Cociasu, on the intercounty conference: "Problems of Environmental Pollution from Pesticides and Fertilizers"]

[Text] The intercounty conference on Problems of Environmental Pollution from Pesticides and Fertilizers, was held on 30-31 October 1976 at Drobeta-Turnu-Severin; it was organized by the General Directorate for Agriculture and the Food Industry, of the Mehedinti People's Council, in collaboration with the Commission for Combatting Environmental Pollution, of the Romanian Academy, the County Health Directorate, the Mehedinti Branch of the Union of Medical Sciences Societies, and the County Commissions for Environmental Protection and Pollution Control.

Participating in the opening of the conference were: T. Alexandru, secretary of the Mehedinti RCP County Committee, and chairman of the County Commission for Environmental Protection; I. Albulet, deputy secretary of the Mehedinti RCP County Committee; Prof. V. Ianovici, chairman of the National Council for Environmental Protection; and Prof. C. A. Vasilescu, member of the Romanian Academy Commission for Environmental Pollution Control.

Some of the papers and communications which were presented are summarized below.

"Problems of Environmental Pollution from Pesticides and Fertilizers," by Dr V. Torjescu: presents cases of human poisoning and environmental pollution from the improper application of pesticides and fertilizers.

"Hygiene and Health Problems Created by Environmental Pollution with Pesticides and Fertilizers," by Prof Gh. Zamfir: touches upon aspects of environmental pollution caused by the use of toxic products, which can in turn endanger the lives of persons who use or handle these products without special precautions.

"Medical and Legal Aspects of Pesticide Poisonings," by Prof M. Terbancea and Dr D. Banciu: statistical presentation of cases of pesticide poisoning during handling or from accidental ingestion.

"Problems and Trends in the Research and Manufacture of Selective and Non-Polluting Pesticides," by Chemist C. Cociasu and Eng Eugenia Halunga: discusses the research costs and the tests to which pesticides are subjected before being placed on the market. Analyzes the main classes of non-polluting pesticides, and particularly third generation pesticides.

"Reduced Pollution -- an Essential Goal in Designing Pesticide Manufacturing Installations," by Eng C. Popa, Eng S. Marinescu, Farming Eng F. Bucur, Eng B. Lupu, Eng Artemiza Dragomir, Eng I. Vacarciuc, Eng M. Pascu, and Eng Ileana Savescu: experiments conducted by the authors suggest the formulation of projects for building pesticide manufacturing installations which will not contribute to environmental pollution around industrial units through discharges, process water, and so on.

"The Herbicide-Fertilizer Interaction, and Corn Production Obtained With Complex Chemification," by Dr Cr. Hera, Dr I. Ghinea, Eng E. Triboi, Eng Valeria Crita, Eng Margareta Bologa, and Dr Gh. Stefanic: based on original research, the authors present the results obtained with corn crops using triazine herbicides.

"Environmental Pollution From the Use of Chlorinated Pesticides in Field Crops," by Eng C. Balescu: the author indicates the danger presented by the continued use of chlorinated pesticides, both in environmental pollution and in possible poisonings.

"The Pollution of Underground Water With Ions Resulting from Fertilizers," by Lecturer I. Constantinescu, Asst L. Sabalocs, and Asst Irina Constantinescu: using a mathematical model, the authors show that the soil acts as an ion exchanger, and explain the case of underground water pollution.

"Sources of Pollution with Fertilizers and Pesticides in Mehedinti County. Steps for Reducing This Pollution," by Eng C. Bulugiu: the author reviews the steps which have led to reduced soil pollution.

"Animal Poisonings with Pesticides," by Dr Gr. Iorgovan: on the basis of tests, the author presents cases of poisoning of animals which come in contact with pesticides through natural feeding.

"Contributions to Establishing Possible Pollution with Triazine Herbicides of Some Food Products," by Dr V. Lupea and Eng A. Preda: research conducted to detect triazine herbicides in grape must and wine, shows that no real danger exists from this standpoint.

"The Accumulation of the Chlorinated Organic Insecticides DDT and HCH in Human Adipose Tissue," by Chemist R. Ciupe: the content of chlorinated insecticides in adipose tissue is determined to be rather high.

"Considerations on Environmental Pollution with Pesticides in Cluj County," by Dr Z. Karacsonyi, Dr I. Ignat, and Dr S. Ciurdareanu: the authors have analyzed various subjects to determine the degree of pesticide pollution in Cluj County.

"The Prevention of Pesticide Poisoning in Horticultural Units in Cluj County," by Dr C. Tintea, Dr Z. Karacsonyi, Chemist O. Bosac, and Dr C. Caseanu: based on the experience gained in studying the cases which could lead to environmental pollution with pesticides, and especially to poisoning of persons who come in contact with pesticides, the authors stipulate various steps which could prevent these accidents.

The papers and communications were heard by a large number of specialists, and were followed by extensive discussions which showed that the negative effects of improper and unscientific chemification in agriculture can create risks for local faunas and for the population. Sustained efforts, which involve the participation of many specialists, are being made to know and reduce these risks.

In concluding the conference, an appeal was made for continued strict control in the use of pesticides and fertilizers, so as to reduce to a minimum the pollution of soil, water, and air, to prevent the destruction of the fauna, and to eliminate the poisoning of men and animals, especially since the number of substances used in agriculture is increasing. Beginning with the current five-year plan, the Ministry of the Chemical Industry will make available to agriculture more effective chemical pesticides and fertilizers, which will be selective and have a low level of toxicity for useful insects, animals, and men.

CSO: 5000

EFFECTS OF POLLUTION, WASTE OF NATURAL RESOURCES DECRIED

Atmospheric Pollution, Use of Filters

Maribor 7D in Slovenian 17 Feb 77 pp 36-37

[Article by Ivo Ivacic]

[Text] Physicians feel that in the last 10 years 500 newborn infants have died in the Ljubljana region alone because of poisoned air. How many have died of the same consequences throughout Slovenia? An increasing number of adults and children suffer from asthma and other respiratory diseases. When the concentration of lethal gases in the air increases, the more seriously ill are in mortal danger. Notwithstanding the adopted legislation no factory has yet ceased to operate because of environmental pollution and no one has gone to jail because of it. While numerous smokestacks are emanating poisonous gases, manufacturers of filtering equipment often have no orders to fill.

In some places the pollution has exceeded all allowable limits. On several occasions air pollution and poisoning registered in Ljubljana was eight times higher than the maximal permissible limit. The situation is no better in Celje, Zasavje, Jesenice, Mezica, Medvode, Crna, parts of Maribor and many other places in Slovenia. With all this no one knows exactly how many people have died because of poisoned atmosphere. Although we have in the last few years passed legislation and formed interest communities on environmental protection, pollution of the atmosphere has not yet been significantly reduced. The smokestacks will continue emanating poisonous gases and noxious particulates for some time to come, infants will continue to die because of poisoned air and many Slovenians will be prematurely sent to their graves. Our lack of awareness is doing us in.

Confusion

If we were aware of the danger threatening because of the polluted atmosphere we would have taken measures to protect our environments. In Slovenia there are no less than 7 manufacturers of filtering equipment and some 20 in all of

Yugoslavia. Unfortunately, for most of them manufacture of this equipment is only a sideline strictly for the sake of profits, not for a desire to make a contribution toward cleaner air. When production of filtering equipment was set up, substantial profits were of primary concern to the manufacturers. Apparently they miscalculated: even though the need is great, orders are few and far between. To compound the confusion our factories prefer to buy--if they buy at all--expensive filtering equipment abroad despite the higher prices and often inferior quality.

We were told this at Gostol TOZD [Basic Organization of Associated Labor] in Nova Gorica which specializes in the manufacturing of filtering equipment. The enterprise employs approximately 200 workers.

"Our first filtering installation was constructed in 1953," says Professional Engineer Boris Jug, director of TOZD filtering equipment. "Since that time our activity has been continuously developing. It would not be amiss to say that we have been very successful in this area and that our products are in no way inferior to those of Western manufacturers."

Gostol's filters for air and water are known throughout Yugoslavia as well as abroad. Thier accomplishments have not been achieved through purchase of expensive foreign licenses as is the case with some other manufacturers and purchasers of equipment, but through product development by their own team of experts. Thus far over 740 filtering installations have been produced which are performing well in numerous Yugoslav factories. Gostol's filtering equipment is cleaning the air in the Ravne iron works, at the IMP foundary in Ivancna Gorica, in Vares, Tuzla and Izola. Soon Gostol equipment will be operating on the 300-ton limekiln in Zagorje.

"We are the only filtering equipment manufacturer who developed our own system for wet and dry cleaning of air. In our TOZD we specialize primarily in removal of gases and particulates in foundries, other metallurgical processes, wood processing industry, and production of lime," says Joze Kobalt, the TOZD's manager of engineering.

This Nova Gorica factory built a new plant in the Tolmin opstina community Cigin. "This is our aid to undeveloped Posocje [Soca River Valley]. The TOZD filtering equipment operation employs many people from the remote settlements of Posocje," says Slavo Kozic, production manager at the Cigin plant. Although Gostol has a capable group of experts who work on the development and perfection of filtering equipment, although they have available new assembly halls--the only ones in Slovenia--for production, and although the Gostol personnel prepare all their drawings and install their equipment in smokestacks or on machinery there is not enough work for the new plant.

"We have developed our own technology to such an extent that we can produce filtering equipment for the entire wood-processing industry, for limekiln smokestacks, and for almost complete removal of gases and particulates in

foundries and metallurgical factories. Nevertheless it happens that collectives give preference to expensive imported filters. The foreign companies do offer a longer guarantee but when the equipment of their manufacture breaks down they never show up to make them good," said filtering equipment sales manager Gorazd Misic indignantly.

Other imported filtering equipment which could be replaced by Gostol's is used at the Anhovo cement plant, Nova Gorica, and many other locations in Slovenia and Yugoslavia. In Bosnia there is hardly a filter installed that was not imported from abroad. The "Sipad" trademark joins no less than 42 factories, all of whom imported their filtering equipment from abroad although they could be manufactured at a lower price and with the same quality by Gostol.

"In Slovenia we are even going so far as to import ordinary filters that could be made by any mechanical shop. In some industrial domains our products could remove gases from the air but some organizations of associate labor manage in one way or another to secure import permits for purchase of expensive filtering equipment from abroad," expostulated Rudi Makuc, a member of the technical staff at Gostol.

Lack of Understanding

At Gostol it is felt that equipment that could be 100 percent effective in cleaning the air has not yet been invented and that it will be some time before such inventions are made. It would be quite an achievement if at least 50 percent of the poisonous exhaust gases and all the particulates, which at respiration can penetrate up to 2 centimeters in the lungs, could be removed.

Moreover, purchase of filtering equipment is associated with considerable expenditures, especially for factories such as Litostroj, Store iron works, Ravne and Jesenice where the problem of poisonous gases and particulates is compounded by high temperatures.

Albert Savli of Gostol feels that these plants, as well as many others, do not have sufficient funds to purchase expensive filtering equipment. In his opinion the wider social community will have to come to the rescue if we are to get rid of the polluted and poisoned air. Despite all that the people's awareness of the problem is still at such low level that they do not understand to what extent they are endangered by breathing the poisoned air. It is in our nature that we are willing to part with some of our income only when we are confronted with an immediate danger. The fact that in Yugoslavia only 0.1 to 0.3 [percent] of the national income is earmarked for environmental protection while some other countries spend 3 percent of it for this purpose shows quite clearly how much importance we attach to healthy environment and clean air.

"In the West as well as in the East considerably more has been done in this area," maintains Boris Jug. "In planning new factories and smokestacks the

filtering equipment is included in the budget. In our country, however, it happens that people begin to think about this problem only after the factory or the smokestack has already been built. It would be much easier and cheaper to include the plans for filtering equipment in the original design so that they could be built in at the same time the plant is constructed."

At Gostol it is felt that our factories have too many plans and too few filtering installations. Thus they are somewhat protected against the "intruding" inspectors. Organizations of Associated Labor are giving them assurances that they will install filtering equipment as soon as funds are available. Thus matters drag on from year to year, and the plans are left in the drawers because the old smokestack will be out of commission in a few years and it would be a waste of money to install expensive filtering installations.

At Gostol we were told, among other things, that they designed free of charge filtering installations for many working organizations but the plans remained unused with the organizations making excuses on grounds that they had no funds.

Without Protection

"The manufacturing of filtering equipment is not well organized, although it is an extremely important activity," maintains Boris Jug. "Our interests are, after all, the interests of the entire society and state. Nevertheless, we are given no protection. There should be more order in this domain. It should be determined what should be done by whom and what should not be done. It is necessary to find funds for research and development of filtering equipment."

In Slovenia and Yugoslavia the principal environmental polluters are still the individual households (50 percent) followed by traffic (35 percent) with industry occupying only third place. Despite this we still have no filters for residential chimneys. In this area the experts at Gostol have done more than anybody else. If they are given appropriate assistance they will begin manufacturing filters for individual households. This will undoubtedly be a great achievement in the domain of environmental protection. Gostol has gone even further. Jointly with Rudis and IGM [Industry of Construction Materials] they set up a special association through which they will pool the resources for research and development of filtering equipment. It would not be amiss if other working organizations in Slovenia were to follow this example.

Maribor Campaign Against Air Pollution

Maribor VECER in Slovenian 10 Feb 77 p 5

[Text] The first topical conference of the Maribor self-managing interest community for environmental protection that took place yesterday was devoted

to problems of environmental protection, proposals and tasks in this area. The introductory remarks were made by Srecko Jurkas, president of the Committee for Air Quality Protection. He pointed out that industrialization has disrupted the natural equilibrium and showed with data how we should provide for sufficient green belts to insure regeneration of the necessary air. He emphasized that poisonous gases released by modern industry are beginning to endanger the forests. Thus in 1969 damage was noticed on 20,000 hectares of forests in Slovenia; the trees, however, are afflicted even before the symptoms of damage appear.

In a long and information-packed discussion the participants drew attention to problems of air quality protection.

A representative of the chimneysweeps' interprise told the delegates that the enterprise acquired equipment for measuring emanations from the chinmeys but that there was scant interest for these. This is strange inasmuch as the chimneysweeps' measurements performed so far indicated that the furnaces and the method of fuel burning are in most cases not optimized. A great deal of fuel could be saved by making annual checks and the environmental pollution would decrease, too.

Vinko Borec, president of the Maribor Executive Council, feels that every effort must be made to regain the lost ground. Among other things he said: "Further air and environmental pollution must be checked while the appropriate measures must not disrupt continued industrial development."

Representatives of the two largest polluters in Maribor, the Ruse nitrogen plant and the Maribor foundry, stated that their enterprises are aware of their responsibility which affects their own health as well as the health of the entire environment. Both feel that society should grant exemption from special taxes on purchases of filtering equipment and reduce or abolish customs duties on filtering equipment that cannot be purchased at home. In the future investment in filtering equipment should be stimulated by appropriate financing.

Several participants proposed continuous monitoring at points of highest traffic density, since it is known that all traffic goes through the center of Maribor. From the discussion we found out that blueprints have hitherto been drawn to such a degree of completion that it would be difficult to change the stoves and furnaces without revising the entire design. In the future all planned construction will accordingly have to be reviewed at its inception.

At the conclusion of the debate the participants demanded that the opstina issue a special decree on air quality protection and provide for preparation of air pollution charts identifying the polluters, who will then be required to immediately prepare programs for regulation of their furnaces and smokestacks.

Legal Action Against River Polluters

Maribor VECER in Slovenian 17 Feb 77 p 16

[Text] In an information release Jozko Pozun, public prosecutor of the Velenje opstina, announced that he requested, on the basis of additional criminal charges lodged by the Celje Public Security Administration and the collected evidence in the Velenje opstina court, that the proceedings in connection with the well-known poisoning of the Paka and Savinja rivers last December be expanded.

The two additional accused are Rudi Leskosek, employed in Gorenje as manager of the TOZD [Basic Organization of Associated Labor] Maintenance, and Edvard Vecernik, manager of the electric group in the same basic organization. Last month the opstina public prosecutor demanded an investigation of suspected filtering installation employees Joze Leskovsek, Rado Milosevic and Franc Centrih. Leskosek and Vecernik also are suspected of committing a felonious offense against public security under article 273/4 of the penal code and a penal offense of endangering lives and property with a dangerous act or instrument under articles 268/3 and 268/4 of the penal code.

The additional evidence indicates that the accused Rudi Leskosek and Edvard Vecernik share the responsibility for the catastrophic pollution of the Paka and Savinja rivers with unneutralized cyanides between 24 and 29 December 1976.

According to the public prosecutor, Rudi Leskosek was, as manager of the TOZD, responsible for all maintenance and repair work in the filtering installation. This installation experienced numerous malfunctions throughout 1976 but Leskosek failed to organize the maintenance work so that the recurring malfunctions could be readily and permanently corrected. In the first place he is suspected of failure to insure faultless operation of the pumping system, negligence is surmised in the maintenance of the alarm system and electrodes indicating the concentration of cyanide, and there are references to negligent maintenance of the entire electrical installation.

Edvard Vecernik, manager of the electrical group, is suspected of failure to organize the electrical systems maintenance work in a manner that would thoroughly and definitely correct the frequent malfunctions of the electrical installations although their proper functioning is essential for the operation of the filtering equipment. It has been established that even prior to the recent catastrophe the unsatisfactory maintenance work on the electrical equipment was causing spillage of the pumping system which resulted in failure of the filtering installation to operate.

According to the collected evidence the two new suspects were, at the frequent malfunctions of equipment, given written instructions to perform the necessary repairs so that the frequent equipment malfunctions were well known to them. The criminal proceedings before the Velenje opstina court will thus be dealing with a group of five accused.

According to the Velenje opstina public prosecutor, the Celje District public prosecutor will probably institute proceedings in the Celje District economic court against the working organization TGO and other persons responsible for the pollution, charging violations of Article 65 of the Water Resources Act as soon as he receives the complaint of the water resources management inspector in Velenje. The Celje District prosecutor's office stated that as of yesterday no complaint from the water resources management inspector had been received.

Disappearance of Green Areas

Maribor VECER in Slovenian 18 Feb 77 p 4

[Text] It is no accident that through various symposia, studies, decrees and the like Slovenians are sounding the alarm because of the increasingly greater air and water pollution. Industry, with its poisonous effluents, is destroying all life in our rivers.

At the last and thus far worst poisoning of the fish in the Savinja River, the despairing fishermen displayed the slogan "Fish Today, Man Tomorrow!" The unhealthy environment, however, represents only one side of the story of our times. We are organizing no symposia on the senseless squandering and destruction of green areas that has been going on for years, nor are the measures of those entrusted with the preservation of green areas sufficiently effective.

It is as if we were closing our eyes before the threatening reality when by destroying green areas we are sawing off the very limb on which we sit. The question comes to mind: What do we gain by preserving clean air and waters if we lose our green areas?

It is frightening to examine what we are doing with green areas in Slovenia. When we adopted the Land-Use Law we said that all would be well from then on. Unfortunately, we were mistaken.

No matter how well written a law may be it is of no use if those for whom it was written have no respect for it and try to evade it. And this is precisely what is happening in Slovenia. How else could one find that every year, notwithstanding the legal regulations, we use up for nonagricultural purposes twice the amount of land than the law allows. If we continue in this way it is not difficult to calculate the time when Slovenians will be left without a single hectare of arable land.

It is obvious that we are often too permissive when we should say no, when we could act but fail to do so. Without making specific accusations we can state that many agricultural land communities share the blame for this state of affairs. For the present the situations where these communities have a firm hold on the land-use policy are rather few.

It appears to be true, however, that people who work in these communities must not infrequently accede to proposals which they know to be inappropriate. The investor often brandishes a slogan saying the social importance of his project, according to him, will make up for the required hectare of green area.

Another great waste is the numerous gravel pits which are growing as mushrooms after rain. As soon as all gravel is taken out and sold no one shows the slightest interest in the pits which, filled by water, become permanent blots on the green areas. We could also criticize the numerous refuse and garbage dumps which despite the protestations from opstinas continue to operate as usual.

Land is our most precious asset, therefore it should not be squandered and destroyed indefinitely. And another thing: waters can be cleaned again but green areas on which we build are lost forever.

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IRANO-SOVIET DRIVE TO KEEP THE CASPIAN CLEAN

Teheran TEHRAN JOURNAL in English 12 Mar 77 p 5

[Article by Bryan Brumley]

[Text]

TWO SOVIET experts on phytoplankton will be arriving in Tehran near the beginning of the year as part of the continuing Irano-Soviet campaign to research and control environmental pollution in the Caspian Sea.

As part of the same program, Iran recently received delivery of a twin-engined American spotter plane equipped with photographic equipment capable of taking four pictures simultaneously to carry out spectrographic analyses of the sea.

Using a variety of lenses and films, the camera will be able to chart currents and thermal patterns, and to trace the movement of harmless substances dropped on the surface to simulate an oil spill.

Irano-Soviet scientific and and technical cooperation in preventing Caspian Sea pollution began three years ago, while the fourth working session stemming from the original protocol was held in Moscow, December 1976.

So far there have been two joint oceanographic expeditions on the Caspian and plans call for the Soviet technical experts to visit Iran, and Iranian postgraduate students to study in the Soviet Union.

Soviet concern over Caspian Sea pollution began a decade ago. A great portion of Soviet industry is located in the Ural Mountains and along the Volga River, historically the mother river of Russia.

A concerted effort was made to monitor and enforce restrictions against dumping industrial wastes in the river.

Most of the pollution from both the north and south of the Caspian is land based, that is results from urban and industrial discharges into [illegible] the sea.

Though the Soviets have been at the problem for longer, Iran has not been idle in setting standards for effluent control, and by November of 1976, 48 percent of the industries in Mazandaran province and 66 percent of those in Gilan had submitted plans for controlling waste discharge into Caspian-bound fresh water.

Another type of pollution on the Caspian, as many bathers can testify, is globules of oil floating on the surface or deposited on the beach. Much of this comes from marine based petroleum related activities at Baku, center of major Soviet oil fields. They have been at some pains to cut down on the drilling and shipping accidents which are the source of the spills.

«These pollution problems are not chronic, but localized,» explained Dr. Mohammad Reza Aalini, head of the water pollution office of the Department of the Environment.

«Both the Soviets and ourselves were conducting activities in this field—we decided we might as well get together,» he continued.

While Iranian activities are conducted largely through the Department of the Environment, there are a plethora of Soviet bureaus, departments and agencies busy in the matter, many connected with the Ministry of Land Reclamation and Water Resources.

In the realm of joint activities, a Soviet research vessel has for two years conducted research below the 38th parallel, picking up four of five Iranian scientists from Bandar Pahlavi on each expedition.

So far, research has concentrated on establishing a basic oceanographic picture of the Caspian: chemical and physical parameters; surface and deep currents from season to season; and thermoclines.

Future efforts may involve collection on fish species and distribution patterns in the sea, perhaps with an eye to commercial possibilities. But right now, the basic data is needed to lay a foundation for future joint research.

«We know, for example, that oil occasionally comes down the coast, but we don't know the route,» Amini said. Experiments involving the aircraft will be conducted to determine the behaviour of Caspian oil slicks with an eye to their control.

«They have conducted an immense amount of research on the Caspian,» Amini continued, explaining the decision for scientific liason with the Soviet Union.

There may be some difficulty in training Iranian scientists and lab technicians in the Soviet Union because of the language, Amini said. The Soviets have suggested that candidates be given a year's language training in the Soviet Union before beginning their scientific training there.

In addition to the joint research, both sides continue domestic programs to keep the Caspian clean, including, on the Iranian coast, efforts to arrest the eutropication of the Pahlavi Marsh, situated between Rasht and Bandar Pahlavi, and an important breeding ground for Caspian fish. Plans range from dredging, constructing artificial lagoons, to harvesting crops of algae as use as livestock feed.

The Pahlavi Marsh will be the subject of the next environmental column.

CSO: 5000

BRIEFS

AIR POLLUTION STUDY--Jiddah--The first test of its kind on an advanced scientific level began at the end of last week when pollution experts started collecting measures of pollution in 'Abd-al-'Aziz Street. Collection of samples of automobile exhausts on this street has been completed. The test will begin tomorrow (Monday) on al-Batha' Street in Riyadh to measure pollution to find out whether the level is moderate or higher. Study of these samples will be conducted to find out the degree of pollution in several cities of the Kingdom (Jiddah--Riyadh--al-Dammam) in comparison with that in other cities of the world. Professor Mahmud Nuwaylati will participate in the continuing collection of data from this test in Riyadh. [Text] [Jiddah AL-MADINAH in Arabic 21 Mar 77 p 3]

CSO: 5000

BRIEFS

TOXIC PRODUCTS--Mr Samaki, a farmer from the village of Kalbe, accidentally killed his seven hunting dogs in one day with endrin, a toxic agricultural product. Mr Samaki's dogs suffered from eczema. He led them to the bank of a small lake, washed them and coated their bodies with endrin, hoping to heal their condition. Unfortunately, the animals licked the product, and on the way back, dropped dead one after another. In the same month, January 1977, another farmer, Mr Metsoe Marcel de Mbethen I, almost caused the death of his three children and even himself under the same circumstances by the use of Gamophele (Gammexane), another very toxic product for fighting agricultural pests. Aid was administered in time to the victims, thus saving their lives. Growers should carefully follow the advice given them by agricultural agents in order to avoid any danger. [Text] [Yaounde CAMEROON TRIBUNE in French 29 Jan 77 p 6] 8895

CSO: 5000

LASER APPARATUS FOR DETECTING AIR POLLUTION

Moscow LENINSKOYE ZNAMYA in Russian 13 Jan 77 p 4

[Article by Tat'yana Kislitsyna: "The Kind of Air We Breathe..."]

[Text] It is well known that billions of tons of conventional fuel is combusted on earth annually. At the same time, even more billions of tons of carbon monoxide is discarded into the atmosphere. The necessity to do combat with atmospheric pollution has stimulated the associates in the radioelectronics sector of the USSR Academy of Sciences Institute of Spectroscopy [ISAN] in Krasnaya Pakhra to work on producing an apparatus which might be used at a distance to detect gaseous contamination of the air. This problem arose several years ago. And now, dropping in at the laboratory, I found myself involved in its relative completion.

Having been shown the device in the middle of the room, the sector chief, L. P. Malyavkin, informed me that its official name is--a device for distance detection of pollution in the atmosphere. Final assembly is under way. A contract has already been concluded with one of the design bureaus of the USSR Ministry of the Chemical Industry which would like to introduce similar devices.

In its final form the device will be placed on a special bus. During its probationary period a telescope tube will move towards a wide open aperture. It will be switched on. There will be an instantaneous laser discharge.

"And the contaminant has been detected," says Leonid Petrovich. "The laser research method is practically instantaneous. In this it has great advantages compared to chemical methods which require taking of single samples. The work is painstaking. Besides, the situation in the air changes every minute and the chemical method cannot provide a complete representation of the atmosphere. Here, having obtained an apparatus with sufficient sensitivity, we will be able to have a complete representation of polluted air in a given area. This is extremely important for meteorology and geophysics."

But it seems we've forgotten about the device. But meanwhile much is already known about it. If you were to take a look you would see that the data are in the form of spectrums. Now they have to be deciphered.

The laser ray excites the portion of the atmosphere under study. Molecules are located there that absorb light and then reradiate it on a different wave length. The telescope receives this light and directs it to a spectral device. Then the various frequencies are separated detecting the molecules of the reradiated gases. A photoelectric receiver measures the intensity of the spectral line belonging to the molecules. Now, by comparing it to the line of nitrogen or oxygen whose concentrations are fairly constant in the atmosphere, it is possible to determine the concentration of the gas in question.

"Well, how can we determine the source of these harmful substances?"

"This is again done with the help of the device. It determines the distance to the contaminating source using the well known principle of radio location. We can also analyze the depth of the contamination layer. The range is several hundred meters. Meanwhile these are only the first tests and we are successful in determining only such powerful pollution sources as plant smokestacks and those of heat and power stations."

The final improvements are under way--check outs. Quite soon the device will be mounted on the bus and it will be ready for mobile testing so that in the future it will help the sanitary epidemiological stations keep track of the purity of the air we breathe and control the smoke exhausts of the industrial enterprises.

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CSO: 5000

ARMENIAN COMMISSION ON ENVIRONMENTAL PROTECTION

Yerevan KOMMUNIST in Russian 30 Jan 77 p 2

[Article: "At the Presidium of the Supreme Soviet of the Armenian SSR"]

[Excerpt] A scheduled session of the Supreme Soviet of the Armenian SSR took place.

The session heard the report of the Commission on the Protection of Nature of the Supreme Soviet (given by deputy S. Oganesyan) on work done by a number of enterprises of the chemical and non-ferrous metallurgical industries of the republic on carrying out the decree of the Supreme Soviet of the Armenian SSR of 25 May 1973 "On Measures for the Further Improvement of Protecting Nature and Efficient Use of Natural Resources in the Armenian SSR." In particular, this concerned measures conducted on these problems at the industrial association Nairit at the Yerevan polyvinylacetate plant Polivinilatsetat, at the Kirovakan Chemical Plant imeni Al. Myasnikyan and at the Kanakerskiy aluminum plant, the Alaverdi mining and metallurgical combine and the Razdan mining and chemical combine.

The presidium noted that in recent years the republic did much specific work on providing efficient use and on protecting natural resources and the environment. In examining the protection of nature as an urgent problem having great social and state significance and as a public duty, the corresponding ministries, departments, enterprises and organizations carried out a number of measures to fulfill the legal requirements in this area. And so, the above indicated enterprises improved production technology on various types of products. New materials and equipment are being used and harmful waste products are being decreased and neutralized. Purification facilities have become operational, dust trapping and other devices to render sewage water, gases and simple ejections into the atmosphere harmless have been activated. Thanks to realized technological innovations at several enterprises there has been a noticeable decrease in the need of drinking water allowing for improvement in the supply to the population.

At the same time the presidium noted that measures adopted in the indicated branches of industry on fulfilling the decisions of the Armenian party cen-

tral committee, supreme soviet and its presidium and the republic's government on environmental protection are all still inadequate and to a great measure lag behind the pace and long-range plans for the development of industry under conditions of scientific and technological progress. This is in accordance with the tasks and decrees of the 25th Party Congress. Special demands were made on the construction organizations who often delay the start up of planned sewage treatment facilities and who do not provide timely and full utilization of capital investments for environmental protection measures as well as for the quality of construction. This causes unfavorable criticism and the work of the corresponding planning organizations, who at times present law quality projects, requires the corresponding corrections and reflects on operational schedules and on the quality of construction at the work sites.

What are the shortcomings? The presidium pointed to the lack of necessary coordination to guarantee environmental protection among the enterprises and organizations responsible for this matter. The necessity was also noted for increased demands to carry out legislation on the protection of nature on the part of the controlling organs--the ministry of health, the republic's prosecutors and the ministry of justice.

The presidium approved work done by the commission on the question under discussion. They tasked the republic's council of ministers to examine a report of the commission and to resolve the organizational and technical questions decided there.

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CSO: 5000

MONITORING THE QUALITY OF THE SEA OF AZOV

Moscow STROITEL'NAYA GAZETA in Russian 30 Jan 77 p 4

[Article by R. Kvyatkovskiy: "Reviving the Sea of Azov"]

[Text] The Sea of Azov is one of the richest of the planet's seas in animal life. But it is difficult to keep this practically closed body of water pure. Rivers that feed the Azov collect water from an enormous area on which 20 oblasts are situated that have highly developed industry, power engineering and agriculture. With every passing year industry and agriculture increase their demands for fresh water and therefore less of it enters the sea.

Today control points of the north Caucasus basin inspection organization for protection of water resources certify the improved condition of the water of the Don--the main artery feeding the Azov. The mightiest river of southern Russia has become cleaner even at the approaches to Rostov and at places lower than that city with 900,000 people. In the cities and enterprises situated on the rivers entering the Don, sewage treatment plants and circulating water supply systems have begun operating in recent years. For water conservation measures in the basin feeding the Sea of Azov, by 1980 still another 300 million rubles will be spent.

But nevertheless the sea is experiencing a significant lack of fresh water. Dozens of cubic km of water are being received in short from the rivers and the Azov is being filled from the Black Sea. This formerly fresh water sea is becoming more and more salty. Extremely sensitive to this process are the "aboriginies"--the pike perch, the bream, carp, sheatfish, sea roaches--have become less thick entering the nets.

The increased salinity of the Azov's water has been the main reason for recently undertaking the transplanting here of river fish from the USA: paddlefish, buffalo fish, American perch. Their acclimatization to Azov Sea conditions is being undertaken by the Scientific Research Institute of the Fish Industry at Rostov on the Don. The new inhabitants are quite calmly readjusting to the increased content of salts in the water and easily adapt to Azov Sea conditions capably enriching its fauna.

The new inhabitants, as the ichthyologists hope, will supplement the schools of sturgeon of the Sea of Azov which are gradually increasing. And so, more and more often detected in the catches are renowned Don carp which had completely disappeared. The fish is indifferent to increased water salinity but is very sensitive to readjusting to water conservation work being conducted in the Don basin. Five years ago the Severskiy Donets, a Don tributary flowing through the most industrialized regions of the Rostovskaya Oblast, was considered practically dead. The construction of sewage treatment plants allowed the river to revive. Now, as before, carp are spawning.

The local irrigation workers on their own initiative built and gave the fish breeders a carp hatchery with a capacity of 120 million young fish a year. In the region of the Miusskiy estuary still another such hatchery is being built. After five years, according to calculations of specialists, the fish take will increase by 10 times.

The country is conducting a great deal of systematic work on the rejuvination of the Sea of Azov. It is supposed that the final stage of this will be the construction of a hydroengineering complex on the Kerch' isthmus. The basis of this will be a regulating spillway dam which in the Azov shallow water period will not permit salty Black Sea water to enter.

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CSO: 5000

ENVIRONMENTAL PROTECTION MEASURES IN KUYBYSHEV

Moscow IZVESTIYA in Russian 4 Mar 77 p 2

[Article by Ye. Murav'yev, chairman of the executive committee of the Kuybyshev Oblast Council of Workers' Deputies: "Multiplying the Riches of Nature"]

[Text] Nature--this is the home in which we live. By man's regard to nature, to his environment, we can judge his value as a citizen and his love for his nativeland. Comrade L. I. Brezhnev, the CC CPSU general secretary stated, "The thrifty and zealous use of natural resources, concern for the earth, the forests, rivers and clean air, for the plant and animal world--all this is our vital communist matter."

I recall these words when I think about the Volga--the mother of Russian rivers. Every person who at one time has seen this river, called the "main street of Russia," is involuntarily filled with enthusiastic love for it. Its significance is great in the development of the cities and villages, in the entire economy of the Volga basin. But as its waters become more and more involved in the economic process, the greater is the concern for the Volga's purity. The concern for the Volga has become a factual state matter as can be attested to by the decree of the CC CPSU and the USSR Council of Ministers "On Measures To Prevent Pollution of the River Basins of the Volga and Ural by Impure Sewage Water."

Kuybyshev, Syzran', Tol'yatti and Zhigulevsk are all cities of the Volga. Industry has developed in them. The construction purification and decontamination installations and devices for our oblast, naturally, has tremendous significance. After the issuance of important party and governmental documents on the cleanliness of the Volga such construction was observed at 34 industrial enterprises and in eight cities of the oblast. This greatly exceeds the program of the Eighth Five-Year Plan. These were the years in which our oblast built sewage treatment plants with an overall capacity of about .5 million cubic meters of sewage daily.

The unconditional fulfillment of the outlined plans became one of the major concerns of the local soviets and the construction and economic organizations. The task required maximum effort. And it was fulfilled. On the oblast's

territory during the Ninth Five-Year Plan 17 mighty water conservation projects and a number of other sewage treatment facilities were constructed. For example, when the Volzhskiy automobile plant and synthetic rubber plant in Tol'yatti were activated the problem of purifying industrial, economic and domestic sewage water of the cities was completely resolved.

We now have 185 operational complexes where 1,550,000 cubic meters of sewage daily undergoes purification. The overall amount of all material discarded into water resources has greatly diminished and the dumping of contaminated water is in excess of three times less.

The Volga and the smaller rivers of the oblast have become significantly cleaner. More favorable have become the opportunities to preserve and reproduce fish supplies. For this purpose the mighty Suskanskoye fishing industry was built in the shallow waters of the Kuybyshev reservoir. Reservoir fish breeding is developing energetically in the oblast.

The protection of nature and a careful regard for the earth--these are the special concerns for the local soviets, standing commissions, and deputies. Efficient measures are being adopted to preserve and multiply the forests, to improve their natural and qualitative makeup, to protect the landscape and other natural features of the Zhigulevskiye mountains and to purify the air basin.

Let us first speak of the land. In our oblast 86,600 hectares are under irrigation. Of these almost 59,000 hectares were put into operation during the Ninth Five-Year Plan. More than 70 km of the Kuyby shevskiy irrigation canal were activated. It passes through the oblast on towards its southern portion towards the Orenburg region and allows for the irrigation of hundreds of thousands of hectares of land and establishes a constant water flow into the parched steppe rivers.

Our concern is for the protection of the Zhigulevskiye mountains, a unique rarity of the Volga region. As far back as several years ago the oblispolkom ceased the removal of land parcels on the Volga shores in the region of Zhiguli that were under construction of new and modernization of on-going industrial enterprises and being developed as deposits of non-metallic building materials. Recently mining work was shut down at the kuybyshev gypsum open-pit mine and at the 41st Kilometer mine. The Sokskoye open-pit mining administration reclutivated land adjacent to the Kuybyshev-Moscow highway. Measures have been taken to protect the forests and improve the protective zone of the Kuybyshev reservoir, the Volga, its tributaries and many of the oblast's small rivers.

In order to preserve Zhiguli as a monument to nature as far back as 1966 the Zhigulevskiy state natural preserve was organized. Five years later in order to set up a protective zone around the preserve and to provide the conditions for renewing and maintaining flora and fauna, a local special natural preserve with controlled limited hunting and special plant care was created on 122,000 hectares. I would like to note that there are still 100,000 hectares that comprise the green zone around the cities and inhabited areas.

Behind all these figures and facts stands a large amount of organizational work from the local soviets, the standing commissions and the executive committees. They systematically examine the problems associated with the protection of nature and with the cautious and efficient use of land.

It would be impossible not to take note of the active role of the oblast soviet of the All-Russian Society for the Protection of Nature. Its activities annually deliver thousands of lectures, issue reports, conduct conversations, put forth posters and leaflets and organize hundreds of exhibitions. Much good work results from the efforts of the public technical committees on the protection of nature and forests. The oblast has its own "Nature Day."

The program of the 10th Five-Year Plan on the protection of nature is quite intense. The overall capacity of new sewage treatment plants must amount to 280,000 cubic meters daily. Planned is the construction and putting into operation of a 70,000 hectare irrigation system. Construction will conclude on the Spasskaya, Zhigulevskayd, Ol'ginskaya and Severo-Chagrinskaya irrigation systems on 46,600 hectares. A great volume of anticorrosion work has to be done. Important measures on protecting forests, improving the water system and the sanitary condition of small rivers and ponds and preventing atmospheric pollution must be done. All this--is in accordance with the decrees of the 25th Party Congress on the need to safeguard and enrich nature and to help it more fully cover itself with life forces.

Something must be said about those large problems whose successful resolution depends not only on our efforts. Now a portion of the contaminating industrial, economic and domestic sewage is still being discarded into water resources without biological purification. These waters are chiefly from small industrial and agricultural enterprises as well as from small cities and rayon centers. Of course it is not too simple to build complexes of sewage treatment plants at such small sites. But it is necessary. From them we expect the most effective and, at the same time, economic recommendations on the construction of small complexes of sewage treatment plants.

Another urgent problem demands solving. As is well known, the petroleum industry in the oblast is located basically in the regions of the small rivers which feed the Volga. Of this the petroleum industry takes half the volume of water it needs to maintain the pressure in the oil-bearing layers.

In connection with this arises the acute need to build pre-purification sewage water projects at the Kuybyshev municipal sewage treatment plants. And then not only the water of the small rivers and artesian water, but the municipal sewage having passed the stage of mechanical and biological purification plus the pre-purification stage might be used to support the pressure of the oil-bearing layers. For a word about the possibilities for the oilmen to use pre-purified sewage water there are the scientists. From them we wait for an answer to another question--on the possibility of using such sewage water for technological water supply at the oil refining and petrochemical enterprises of Novokuybyshevsk.

There must be an immediate solution even to a number of important problems on preserving the natural complex of Zhiguli, in particular on the recultivation of spent open-pit mines. The realization of this work depends on the USSR Ministry of Power and Electrification, the USSR and RSFSR building materials industry ministries as well as the RSFSR Ministry of Motor Vehicle Transport.

Great concern is caused by the situation in preserving the natural complex of the Samarskaya river bend. Together with the Zhigulevskiye mountains, this is the most beautiful spot in the Volga region. Preserved here still are living witnesses to the ice age, unique relic plant life. To preserve the Samarskaya bend I think it is necessary to organize a state national natural park here.

Only by our overall efforts is it possible to successfully resolve the extremely important problems involved in preserving the beauties of the Volga and the pearls of the Volga region--the Zhigulevskiye mountains. The oblast's local soviets recognize their duties here. Under the management of party organizations they carry out much work to protect and multiply natural riches.

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BRIEFS

TALLIN DECREASES SMOKE POLLUTANTS--A proverb tells us "Where there's smoke, there's fire." But why do heat and electric power stations [TETs] produce smoke at various times irregularly even with a stable feed of fuel? It is not possible to keep smoke in the air to the lowest limits? The scientists of the Tallin Polytechnical Institute set this task before themselves. According to a contract with the Tallin machine building plant Il'marine, a manufacturer of atomizers for the country's TETs, a study was made on combustion of petroleum residue in the furnaces of boiler units. It was proven that the injector spray tips through which the fuel passes work only one month. Whereupon, the combustion is mostly effective for only its first half. Subsequently, under the influence of mineral particles found in the petroleum residue, the steel of the atomizers is worn away. This leads to increased amounts of non-combusted fuel. Associates at the powdered metallurgical laboratory at the institute developed a simplified design for an atomizer that collectively combined several subassemblies. They proposed producing it not of steel, but rather of wolfram and cobalt by caking it in the shape of a powdered blend of these metals. "It seems that the technology was complicated," said the laboratory chief, P. Kulu, "the manufacture of components was double the cost but then their useful period rose more than 10 times." The new burners set up as an experiment at the Moscow TETs and at the Stavropol' hydroelectric power station allowed not only for decreased smoke in the air but lowered the expenditures on equipment use and raised the efficiency in fuel combustion. [Text] [Riga SOVETSKAYA LATVIYA in Russian 5 Jan 77 p 2] 8504

CSO: 5000

FIRMS PRESSURED ON CHEMICAL WASTES

Copenhagen LAND OG FOLK in Danish 15 Feb 77 p 6

[Article by Bent Christiansen: "LAND OG FOLK's Criticism Has Had an Effect: Now Firms Must Give an Account on the Environment"]

[Text] A greater number of firms in Copenhagen are being called upon once more lately to discontinue their pollution with petroleum and chemical wastes. After LAND OG FOLK's reference to the flourishing state of environmental crime in the area of the capital the Municipality of Copenhagen has now decided to abandon its saintly patience with industry's illegal acts.

In a letter to LAND OG FOLK Environmental Chief Alsing Andersen says that the municipality has made a number of attempts to make firms behave:

"All these efforts have had some result, but not enough of one, and we are therefore recently approaching once again a number of firms who we think have chemical wastes which they should be held accountable for," the chief writes.

Sounded the Alarm

Alsing Andersen points out that the Municipality of Copenhagen has for many years had a receiving station at Teglholmen, where firms can dispose of their petroleum and chemical wastes, so that for a slight fee they can be sent to be broken down at Kommunekemi [Municipal Chemical Treatment Plant] in Nyborg.

But only a few firms have made use of this arrangement, for it has been less expensive for them to dump their waste either into the sewer system, at the dump, or directly out into Øresund [the Sound].

A couple of weeks ago the management of Kommunekemi sounded the alarm after completing its balance sheet for 1976. It turned out that around 120,000 tons of petroleum and chemical waste were produced by the country as a whole last year, but Kommunekemi received only 27,000 tons for decomposition.

At the same time Kommunekemi drew attention to the fact that only around one out of 10 firms in Copenhagen were following the provisions of the law,

which states that petroleum and chemical waste must for one thing be reported to the municipal authorities, and for another brought for decomposition at Kommunekemi.

"No one could expect that the new rules regarding delivery of chemical waste introduced on 1 April 1976 would be in full effect as of the first day," writes the environmental chief, and continues:

Insufficient Results

"Much effort has been extended to get the chemical waste out. In cooperation with the other municipalities in Greater Copenhagen a large advertisement was inserted regarding the new rules in May 1976."

"Since we did not think that this produced the desired result, in August we wrote to 600 firms which we would expect had chemical waste from their production. Finally in November 1976 the Environmental Protection Agency sent out inquiries to 21,000 firms throughout the entire country."

Alsing Andersen states further that now attempts are being made again to get firms to conform to the law. He does not give any indication of which firms are especially being kept an eye on. But LAND OG FOLK is aware of the fact that the Berlingske newspaper concern, for example, does not send so much as a drop of the firm's many tons of chemical waste to Kommunekemi.

What we miss especially in the environmental chief's otherwise long letter is an explanation of why the municipality has not long since used the law's clear regulations to put a stop to industry's environmental crimes.

The provisions regarding petroleum and chemical waste state explicitly that the waste must both be reported and delivered in its entirety. Furthermore that fines and fixed penalties can be imposed if this does not take place.

There is absolutely no excuse for this dangerous pollution, especially not when a receiving station whose expense is paid for by the municipality has existed for many years.

Alsing Andersen discloses in the conclusion to his letter an almost catastrophic lack of insight into the problems when he writes:

"By these remarks I wanted to assure you that we in the Municipality of Copenhagen are pursuing this question with great attention, but there necessarily must be produced a set of information on the amount of chemical waste and its composition before any suggestions can be presented to the municipal council regarding how these matters can be handled in the best way possible."

All Wrong

Apparently the environmental chief is not familiar with the figures for the amount of chemical waste which Kommunekemi published recnetly. This is

incomprehensible when Alsing Andersen is a member of Kommunekemi's board of directors and environmental chief in Denmark's largest industrial area.

Kommunekemi reports that 56,900 tons of chemical waste were produced in 1973, increasing to 78,000 tons in 1978. These figures are based exclusively on information from various branch organizations of industry, so they have not been set too high in any case.

The greater part of the chemical waste consists of inorganic compounds. In this connection Kommunekemi's technical chief, John Tøffner-Clausen, points out: "We have worked out an estimate indicating that we receive only a scant five percent of the inorganic waste produced in the Copenhagen area."

LAND OG FOLK must therefore request that Copenhagen's environmental chief procure the documentation he must be missing at Kommunekemi. The harsh facts have for a long time been accessible knowledge to anyone wanting to confront them.

Likewise the corporation in the Copenhagen Town Council should not at all wait for any sort of "precedent." The law provides what municipalities must do in every detail, in keeping with the proclamation on chemical waste of 17 March 1976.

Later this month or in the beginning of March Chief Alsing Andersen will have use of more detailed knowledge of actual conditions, namely when he must give the town council a report on serious problems. This is occasioned by a question which Councilman Bodil Emanuel (DKP [Communist Party of Denmark]) has requested be put on the agenda.

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NUCLEAR POLLUTION CHARGE LEVELED

Paris LE MONDE in French 18 Mar 77 p 23

[Text] Grenoble--The former director of the CENG [Grenoble Nuclear Studies Center], Mr Pascal, and the head of the environment studies protection service at the CENG, Mr Limongi, were both charged with 'nuclear pollution' by Judge Daniel Farge in Grenoble.

On 4 November 1974, the Association for the Protection of Malville and Pugey filed a complaint against persons unknown for polluting the water table of Grenoble.

The whole matter came to a head on 26 September 1976 [corrected to 1974 in 20-21 Mar 77 issue], although the first leak of radioactive antimony into the water table took place on 19 July 1974. On 2 December 1975, the examining judge appointed three experts who said in their report submitted 10 months later that "the radiation analyses of certain sections of the water table extending under the site of the CENG and of the ILL [Laude Langevin Institute] showed significant radiation... The CENG and the ILL installations are the cause of the [nuclear] pollution of the Isere Department water table, and this radioactive pollution is significant."

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DUTCH GOVERNMENT DEMANDS FAST ACTION ON RHINE POLLUTION

Interparliamentary Rhine Conference

Rotterdam NRC HANDELSBLAD in Dutch 26 Feb 77 p 2

[Text] The Hague,26 Feb. Parliaments of the Rhine River countries must approve the two treaties against the pollution of this river as soon as possible. In anticipation of this there will have to be reorganization programs that are consonant with each other so that it will be possible to carry out the agreements immediately after they are approved. So reads the text of the recommendation of the Interparliamentary Rhine Conference which was concluded in The Hague yesterday at noon.

This urgent desire formed a part of the joint resolution which in turn is based on the separate texts of the French, West German and Dutch Delegations. The basic point in the resolution is the desire for more parliamentary control measures.

For this reason the proposal has been made to provide parliaments, through their governments, with all the information on pollution immediately. The International Rhine Commission, which in France, Germany, Switzerland and Holland is negotiating at an official level, should be handing over its reports on the progress of its work to the parliaments, and for that matter (through the intervention of the governments) to the European Committee in Brussels.

Moreover, the Rhine Committee must convene at least three times a year for the purpose of expediting the execution of the accords concluded. In connection with this, attention was also drawn to the work that is still to be done: An agreement with regard to the thermal charge of the Rhine waters, namely the heating of the Rhine waters as a result of the drainage of cooling waters for example, from atomic power stations.

More Collaboration

There was also an expression of desire for a more intensive mutual collaboration, among the national parliaments and with the European Parliament, aimed at promoting the clean up of the Rhine. A small interparliamentary

working group will have the task of preparing this. The effort is aimed at reconvening a conference of this type before 1 May 1978. Among the various things that were determined with regard to the resolution was that the Rhine waters are still threatened by many dangers despite efforts at a national level to protect and improve their quality.

Those who went to the conference also discovered that the entire problem of the environment would be simplified considerably if the first directly chosen European Parliament will get more authority on this matter.

Satisfied

Dr J. Terlouw, who took the initiative for the conference, appeared to be very satisfied on the results achieved as the conference came to a close. According to him the 2-day meeting resulted in speeding up the struggle against the pollution of the Rhine. In addition a new impulse was given to the political willingness to collaborate in cleaning up the river; moreover, public opinion also took heart.

Regulation of Rhine Pollutants

Rotterdam NRC HANDELSBLAD in Dutch 26 Feb 77 p 2

[Article by F.G. de Ruiter: "Parliament's Members Have Too Little Say on the Rhine]

[Text] During the interparliamentary conference on the pollution of the Rhine which took place this week in the Hague one of the old Livius pronouncements: "While the senate meets Seguntum goes down" was again brought to mind. Applying this winged phrase to the topic at hand was the obvious thing to do and Seguntum need only be replaced by "Rhine."

Of course the reality of the situation is not as dramatic as this, despite the continuous complaints about this river. These are the same old songs of how bad the Rhine is as a result of domestic, but most industrial, drainage that are heard over and over again. One often hears about the "Swere of Europe" and figures are being shown on charts intended to show the seriousness of the situation.

Chemistry Treaty

When on 3 December of last year the so-called pure chemistry treaty was signed in Bonn there appeared to be reasons for some joy, because now at last a step was taken towards improvement. But the insiders know how small this step turned out to be and how much deliberation is still necessary in order to complete the framework for an agreement.

Just to name a few things: It will be necessary to establish emission norms for harmful substances; how much refuse can an industry discharge

into the Rhine and how much must it hold back? The answers for these sort of questions must come from the International Rhine Commission which is the official deliberating organization of the Rhine River Countries and within this college there will be lengthy disputes over logic before the parties involved find a compromise.

But, as the Dutch delegation notes, this is happening without there being a previous political agreement on the question of how much refuse as a whole is to be considered as the permissible amount for the Rhine. The negotiating by the experts are thus acquiring a political aspect which falls outside the immediate field of vision of the parliaments. The Rhine Commission is not held accountable to the representation.

Actually the Chemistry Treaty is a sort of repository for standards and measures carried out and the control of drainage in a country. We have often said that this is an incorrect formula and even the Terlouw group has nothing good to say about it. What is now happening is in principle in conflict with its concepts on democratic legal order.

Salt Discharges

The extent to which the parliaments stand aside is especially apparent from the recent news about the salt discharges from the French potassium mines. Already, the treaty which must limit these discharges is failing as the basis for strong measures. France is committed to eject 60 kilograms of salt per second into the ground instead of dumping it into the Rhine, doing so in phases. As the situation stands now (1980 has been selected as the target date, but it may be much later) this would mean an improvement of barely 20 percent. Eighty percent of the total salt charge that is carried along by the Rhine at this time remains unaltered.

Now comes the news that the local French authorities are ignoring this agreement, limited as it is. In April of last year the prefect of the Upper Rhine Department gave orders that the temporary storage of sale in buffer basins be stopped. Previously the discharges had to maintain the same pace with the river's draining action and that meant that during low tides the potassium mines would hold back the sale in the basins. Now this measure has been repealed and during low tides the Rhine can become saltier than ever.

The Rhine Lawsuit

This affair demonstrates clearly the need for perfect control in the matter of living up to the Rhine Agreement. The control failed apparently because here in Holland the case was not known until a few weeks ago. The organization of Rhine waters industries discovered what was going on at Elzas and it became known.

Moreover this event has underscored the importance of the civil suit which has been filed against the potassium mines. Because politicians have until now lacked the means of power it has become necessary to have citizens who will work for a cleaner Rhine along legal lines.

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END